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MONTHLY REPORT - DECEMBER 1980

TABLE OF CONTENTS AND RESEARCH HIGHLIGHTS

Page

PUBLICATIONS 1

HONOLULU LABORATORY 10

NOAA Ship Townsend Cromwell Returns From Cruise to the Northwestern Hawaiian Islands 10

LA JOLLA LABORATORY 12

Fishing Partyboat Data Analysis Prepared for Center 14
Data Report Completed on 1979/1980 Staged Anchovy Eggs and Larvae 16
Study of Age and Sex Structures of Porpoise Schools Underway 18
Biologists Inspect Dead Pilot Whales and Sea Lions at Santa Catalina Island 18

TIBURON LABORATORY 22

Tag Returns Shed Light on Movements of Brown Rockfish 22

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS 24

Teletype to Radio Station WWD Transferred to SWFC's ADP Operations 25

MISCELLANEOUS 26

Honors and Awards, Seminars, Public Affairs, Visitors, Meetings and Travel, and Personnel 26

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SOUTHWEST FISHERIES CENTER

LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - DECEMBER 1980

STATUS OF PUBLICATIONS

Published

Coe, James M. and Warren E. Stuntz. 1980. Passive behavior by the spotted dolphin, Stenella attenuata, in tuna purse seine nets. Fishery Bulletin, U.S. (Note) 76(2):535-537.

Huppert, D. D. 1980. An analysis of the United States demand for fish meal. Fishery Bulletin, U.S. 78(2):267-276.

As fishery management plans are developed under the Fishery Conservation and Management Act of 1976, economic evaluation of management procedures will be necessary. To address the economics of optimum yield adequately, for instance, research will be required in the traditional economic subjects of demand, production and costs, industrial organization, and international trade. This paper addresses the domestic demand for the primary industrial fishery product--fish meal. In developing the demand model, the important points are: 1) choice of empirical variables for inclusion in the model, 2) determination of appropriate functional form of the demand equation, 3) treatment of the "simultaneity bias" problem, and 4) choice between a static (or equilibrium) model and a dynamic model. The paper presents maximum likelihood estimates of both the static and dynamic models. With either model, the price elasticity of demand is high when fish meal price is low, and low when price is high.

Husby, D. M. and G. R. Seckel. 1980. Water structure at Ocean Weather Station V, Northwestern Pacific Ocean, 1966-71. NOAA Tech. Rep. NMFS-SSRF-742, 56 pp.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

The oceanographic station data obtained at Ocean Weather Station V from 1966 to 1972 by the U.S. Coast Guard are analyzed and presented in a form suitable for water structure studies. Temperatures, salinities, and depths are given as a function of density (sigma-t). Harmonic analysis was used as a curve-fitting technique to obtain parameters for these properties as a function of time. Harmonic coefficients and interpolated values at the first of each month for the 6-year series are tabulated in an appendix. Temporal distributions of salinity and depth are described. At depths greater than sigma-t 26, temperature-salinity relationships remain relatively constant in time. Depth variations at these levels are attributed primarily to meanders of the Kuroshio Extension. The surface divergence, as reflected by changes in the depth of sigma-t 26, has no annual periodicity. The 6-year record shows that large baroclinic variability occurs at time scales of more than 55 days, with largest variability occurring at the interannual scale. Heat budget estimates show that the effects of local ocean-atmosphere exchange processes are obscured by advected properties. For example, the heat content of the layer above sigma-t 26 is primarily determined by the divergence of this layer and anomalies in the mean temperature are produced by heat advection rather than heat exchange across the sea surface.

O'Connell, Charles P. 1980. Percentage of starving northern anchovy, Engraulis mordax, larvae in the sea as estimated by histological methods. Fishery Bulletin, U.S. 78(2):475-489.

The proportion of starving larvae of northern anchovy, Engraulis mordax, was estimated for the Southern California Bight in March 1977 from histological examination of larvae for 64 1-m net tow samples. The number of larvae in the tows varied from 0 to about 400. Approximately 6 per tow were sectioned and examined with the light microscope. Twenty-six specimens were identified as emaciated from anomalies of the trunk musculature and digestive tract. Some of the emaciated larvae occurred as isolated cases at widely scattered locations, but most were from a few nearshore tows, indicating "patches" of starving larvae. Temperature and plankton volume data indicate that the patches were associated with fluctuating environmental conditions. The samples indicate that about 8% of northern anchovy larvae in the Southern California Bight were starving.

Owen, R. W. 1980. Eddies of the California Current system: Physical and ecological characteristics, pp. 237-263. In: Dennis M. Power (ed.), The California Islands. Proceedings of a Multidisciplinary Symposium, Santa Barbara Museum of Natural History, 787 p.

Parker, Keith. 1980. A direct method for estimating northern anchovy, Engraulis mordax, spawning biomass. Fishery Bulletin, U.S. (Note), 78(2):541-544.

The following Honolulu Laboratory papers were published In Richard W. Grigg and Rose T. Pfund (editors), Proceedings of the Symposium on Status of Resource Investigations in the Northwestern Hawaiian Islands, April 24-25, 1980, University of Hawaii, Honolulu, Hawaii. Sea Grant Misc. Rep., UNIHI-SEAGRANT-MR-80-04.

Gilmartin, William G., Robert L. DeLong, Alvin W. Smith, Lynn A. Griner, and Murray D. Dailey. 1980. An investigation into unusual mortality in the Hawaiian monk seal, Monachus schauinslandi. pp. 32-41.

Increased mortality was reported in the endangered Hawaiian monk seal population at Laysan Island in the spring of 1978. An investigation of the possible causes of the mortality included sampling of healthy, sick, and dead individuals. Analyses comprised gross and microscopic pathology, hematology, serum chemistry, virology, bacteriology, parasitology, and toxicology. Gastric ulceration in varying degrees due to nematodes was a consistent finding. Evidence that calici-viruses (VESV and SMSV) and a Salmonella spp. are in the population was found. Two of 18 seals tested had elevated total white blood cell counts. A few individuals differed significantly from mean serum chemistry values but no trend was apparent. Liver tissues of two seals tested for ciguatoxin and maitotoxin were positive.

Gooding, Reginald M. 1980. Exploratory fishing on the Hancock Seamounts by the Townsend Cromwell, 1976-79. pp. 241-250.

Under authority of the U.S. Fishery Conservation and Management Act (FCMA) of 1976, which extended jurisdiction over fishery resources within 200 miles of the nation's coastline, the National Marine Fisheries Service initiated a program to collect catch and effort data and biological information on the pelagic armorhead, Pentaceros richardsoni, and alfonsin, Beryx splendens, at Hancock Seamounts which fall within the Fishery Conservation Zone. Data were collected from three sources--research cruises of the NOAA ship Townsend Cromwell, fishing trips of Japanese commercial vessels carrying U.S. observers, and fishing trips of Japanese commercial vessels fishing in 1969-76 prior to the enactment of the FCMA. The preliminary results of this study showed that 77% of the Cromwell's catch in 1979 consisted of armorheads, that night trawling was significantly more productive than day trawling, and that 95% of the armorhead were the so-called "lean" type. Experimental handline fishing over the seamounts revealed

that in addition to armorheads and alfonsins, the Japanese mackerel, Scomber japonicus, also appeared to be in relatively good numbers.

Harrison, Craig S., and Thomas S. Hida. 1980. The status of seabird research in the Northwestern Hawaiian Islands. pp. 17-31.

The five-year objectives of the U.S. Fish and Wildlife Service (FWS) are to enumerate Northwestern Hawaiian Islands seabird populations, inventory food utilized, locate major feeding areas, and determine consumptive rates. To date, preliminary assessment of populations has begun and a comprehensive food habits study is nearing completion. The 3,000 food samples from 18 seabird species analyzed thus far indicate that most birds feed opportunistically on shoaling fish and squid. The fish families Exocoetidae, Mullidae, Carangidae, Synodontidae, Dussumieriidae, Coryphaenidae, Molidae, and Holocentridae, and the squid family Ommastrephidae, appear to be especially important. Prey length data indicate that terns and shearwaters feed on prey species in the 2-8 cm range and that boobies feed in the 10-20 cm range. An encouraging feasibility study using radiotracking with the brown noddy on Oahu developed a technique to locate feeding areas. Future objectives include completion of food study and refinement of population estimation techniques. Informational gaps still include location of feeding areas and knowledge of consumptive rates of seabirds. A better understanding is needed of life histories, age structure, and annual production of important prey items including Ommastrephidae, Exocoetidae, Mullidae, and Synodontidae.

Honda, Victor A. 1980. Preliminary results of studies on fecundity of the spiny lobster, Panulirus marginatus, in the Northwestern Hawaiian Islands. pp. 143-148.

Part of an investigation of the marine resources of the Northwestern Hawaiian Islands includes studies on the biology of the spiny lobster, Panulirus marginatus. This paper deals with the fecundity of P. marginatus collected from Necker Island and Maro Reef during 1978-79. Estimates of fecundity were made on 34 egg-bearing females. The number of eggs carried generally increased in relation to an increase in carapace length (CL). The smallest female (56.7 mm CL) in the sample carried an estimated 129,000 eggs. The largest female (104.6 mm CL) was found to have an estimated 454,000 eggs.

Humphreys, Robert L., Jr. 1980. Feeding habits of the kahala, Seriola dumerili, in the Hawaiian Archipelago. pp. 233-240.

Stomach contents of kahala, Seriola dumerili, were examined for a determination of possible relationships between the feeding habit and incidence of ciguatoxicity in this species and also as part of a study on its overall life history. Preliminary results

indicated a change from cephalopods to fish as the principal dietary constituent with increase in weight of kahala. Also, the diet of fish caught in the Northwestern Hawaiian islands appeared more varied in terms of a larger combined cephalopod and crustacean volume than those caught in two other areas within the main islands. Fish dominated the diet of kahala with Carangidae the largest contributor among forage items. High incidences of parasitic nematodes and trematodes were observed, with nematodes the most predominant in occurrence. Further examination of stomach contents are needed to ascertain the dietary trends indicated thus far.

Ito, Bernard M., and Richard N. Uchida. 1980. Results of ciguatera analysis of fishes in the Northwestern Hawaiian Islands. pp. 81-89.

Ciguatera is a form of fish poisoning caused by ingestion of certain species of fish. This study deals with the distribution of ciguatoxic fishes in waters of the Northwestern Hawaiian Islands (NWHI) and with a market sampling program to detect and remove ciguatoxic amberjack or kahala, Seriola dumerili, prior to its sale to the public. The results showed that ciguatoxic fish occurred throughout the entire NWHI from Nihoa to Kure Island. There were no detectable trends in rejection rate of the NWHI fishes with respect to area of capture; however, the analysis of data collected on kahala indicated a higher incidence of toxic fishes in the Nihoa-Raita Bank region. Of the 47 NWHI species tested between 1977 and 1979, the rate of rejection, based on a recently developed radioimmunoassay, was higher among fishes in the snapper-grouper complex. These included Caranx ignobilis, C. cheilio, Seriola dumerili, Epinephelus quernus, Etelis carbunculus, Lutjanus kasmira, and Pristipomoides filamentosus. Among inshore species sampled by the National Marine Fisheries Service and the Hawaii Division of Fish and Game, particularly high in rejection was Kuhlia sandvicensis and Cheilinus rhodochrous, followed by Myripristis amaenus, M. murdjan, Mugil cephalus, Caranx melampygus, Polydactylus sexfilis, and C. ignobilis. Of 926 kahala sampled between April and December 1979, 116 fish or 13% were rejected. The rate of rejection, high in April-May, declined steadily to December. The results also showed a low positive but significant correlation between fish size and toxicity.

Kikkawa, Bert S. 1980. Preliminary study on the spawning season of the opakapaka, Pristipomoides filamentosus. pp. 226-232.

As part of the survey and assessment program of the Northwestern Hawaiian Islands, the National Marine Fisheries Service has been studying the distribution, apparent abundance, and biology of commercially valuable bottomfish. This study deals with the reproductive cycle of the opakapaka, Pristipomoides filamentosus, one of the most important snappers in the Hawaiian fishery. The

results showed that the development of ova within the paired ovaries is heterogeneous. Stages of maturation, determined from the development of ova in the most advanced mode in the distribution of random ova diameters, showed a positive relationship with the gonadal somatic indices. The gonadal somatic index peaked in August, with spawning possibly taking place in September.

Moffitt, Robert B. 1980. A preliminary report on bottom fishing in the Northwestern Hawaiian Islands. pp. 216-225.

Regional and day-night differences in the distribution and catchability of bottom fishes are shown through analysis of catch data collected by the National Marine Fisheries Service on cruises of the NOAA ship Townsend Cromwell in the Northwestern Hawaiian Islands. Large catches of opakapaka, Pristipomoides filamentosus, in the Nihoa to Gardner Pinnacles region were replaced by those of hapu'upu'u, Epinephelus quernus, further up the chain. Mean fish weight for several species increased going up the chain, possibly due to fishing pressure in the Nihoa to Gardner Pinnacles region. Day fishing resulted in a greater catch rate than night fishing. Preiminary growth estimates indicate that opakapaka reach a size of 70 cm fork length in 3.25 yr, whereas kahala, Seriola dumerili, reach the same size in 1.75 year.

Polovina, Jeffrey J., and Darryl T. Tagami. 1980. Population estimates and yield-per-recruit analysis for the spiny lobster, Panulirus marginatus, at Necker Island. pp. 149-159.

Data from commercial fishermen and research sampling for lobster fishing at Necker Island are examined. The abundance of lobster appears to be very heterogeneous, with the greatest abundance in the northwestern part of the Necker bank. Estimates of virgin population size and catchability for this region are 125,000 legal lobsters and 3.94×10^{-5} per trap-night, respectively. The estimated range of sustainable yield from the northwest region based on the minimum legal size of 8.25-cm carapace length and the present population size is 10,000-211,000 legal lobsters per year. Yield-per-recruit analysis indicate that substantially greater yields may be possible if the minimum legal size is reduced from 8.25 cm. However, this latter result is based on strong assumptions about recruitment which can only be confirmed by field tests.

Polovina, Jeffrey J., and Darryl T. Tagami. 1980. Preliminary results from ecosystem modeling at French Frigate Shoals. pp. 286-298.

The marine ecosystem at French Frigate Shoals is discussed and preliminary results of the modeling work are presented. Application of the Bulk Biomass Model produces biomass estimates and turnover rates for species groups at French Frigate Shoals

which consist of seabirds, monk seals, tiger sharks, small sharks, turtles, small pelagics, carangids, reef fishes, lobsters, snappers and groupers, shrimps, nearshore scombrids, and benthos.

Shomura, Richard S. 1980. Introduction of tripartite and Sea Grant research programs in the Northwestern Hawaiian Islands. pp. 9-13.

Uchida, Richard N., James H. Uchiyama, Robert L. Humphreys, Jr., and Darryl T. Tagami. 1980. Biology, distribution, and estimates of apparent abundance of the spiny lobster, Panulirus marginatus (Quoy and Gaimard), in waters of the Northwestern Hawaiian Islands: Part I. Distribution in relation to depth and geographical areas and estimates of apparent abundance. pp. 121-130.

This paper describes the results of field surveys conducted by the Honolulu Laboratory on the spiny lobster, Panulirus marginatus in the Northwestern Hawaiian Islands. Of 17 islands and submerged banks surveyed from October 1976 to November 1978, only Necker Island and Maro Reef had sufficiently large stocks of spiny lobsters to warrant commercial exploitation. The distribution of spiny lobsters in relation to geographical area and depth is also discussed. Future research needs were identified, including specialized data on the environment and the stocks to estimate their magnitude and potential yield, data on seasonal and spatial variation in stock distribution and abundance, and observations on behavior of spiny lobster in relation to biological and environmental conditions.

Uchida, Richard N., James H. Uchiyama, Darryl T. Tagami, and Paul M. Shiota. 1980. Biology, distribution, and estimates of apparent abundance of the spiny lobster, Panulirus marginatus (Quoy and Gaimard), in waters of the Northwestern Hawaiian Islands: Part II. Size distribution, legal to sublegal ratio, sex ratio, reproductive cycle, and morphometric characteristics. pp. 131-142.

Population structure in terms of size, legal to sublegal ratio, sex ratio, and reproductive cycle is defined for the spiny lobster, Panulirus marginatus, in the Northwestern Hawaiian Islands. Trapping operations were conducted in waters of the Northwestern Hawaiian Islands from October 1976 to November 1978. Striking differences were noted in average sizes of lobsters among the various islands and banks surveyed. At Necker Island, where catch rates were estimated to be the highest in the island chain, the average sizes of males and females were the smallest. The proportion of legal lobsters in the catch was relatively high in most areas and males usually predominated. Egg-bearing among females showed marked seasonality with peaks in early summer and fall. The length-weight relationship showed that males usually weighed more than females up to 65 mm carapace length, but beyond this size the females were heavier than males of equivalent sizes. Future research will be directed toward collection of data to

monitor changes in the population structure and to better define the reproductive cycle.

Uchiyama, James H. 1980. Survey of the pelagic fishes of the Northwestern Hawaiian Islands. pp. 251-263.

Longline fishery catch statistics were used to estimate relative abundance of true pelagic species within the Fishery Conservation Zone of the Northwestern Hawaiian Islands. Relative apparent abundance of coastal pelgic species ws determined by trolling surveys. Growth curves for Euthynnus affinis and Thunnus alalunga were estimated from otolith age determinations. A study of the fecundity of Acanthocybium solandri has begun.

Approved by Center Director

Hunter, John R. Feeding ecology and predation of marine fish larvae. For publication in the University of Washington, College of Fisheries, Sea Grant Lectureships on the Early Life History of Marine Fishes.

Kaya, Calvin M., Andrew E. Dizon, Sharon D. Hendricks, Thomas K. Kazama, and Martina K. K. Queenth. Stress-induced egg maturation and ovulation of skipjack tuna, Katsuwonus pelamis. For consideration for publication in Fishery Bulletin, U.S.

Lasker, Reuben. Recruitment: Density dependent or independent? For publication in the University of Washington, College of Fisheries, Sea Grant Lectureships on the Early Life History of Marine Fishes.

Moser, H. G. Morphological and functional aspects of marine fish larvae. For publication in the University of Washington, College of Fisheries, Sea Grant Lectureships on the Early Life History of of Marine Fishes.

O'Connell, Charles P. and Pedro A. Paloma. Histochemical indications of liver glycogen in samples of emaciated and robust larvae of the northern anchovy, Engraulis mordax. For consideration for publication in Fishery Bulletin, U.S.

Smith, Paul E. I. Pelagic fisheries: General features. II. Larval anchovy patchiness. III. Sampling to determine anchovy larval mortality in the seas. For publication in the University of Washington, College of Fisheries, Sea Grant Lectureships on the Early Life History of Marine Fishes.

Smith, Paul E. and Richard E. Eppley. Primary production and the anchovy population in the Southern California Bight: Comparison of time series. For consideration for publication in Limnology and Oceanography.

Translation

Harada, Teruo, Osamu Murata, and Seiji Oda. 1980. Rearing of and morphological changes in larvae and juveniles of yellowfin tuna. Bull. Fac. Agric., Kinki Univ. 13:33-36. (Engl. trans. by Tamio Otsu, 1980, 8 p., Transl. No. 51; available Southwest Fish. Ctr., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Administrative Reports

Honolulu Laboratory

Hendrickson, J. R., and L. P. Hendrickson. 1980. "Living tags" for sea turtles. SWFC Admin. Rep. H-80-17C.

La Jolla Laboratory

Methot, R. and R. Hewitt. 1980. A generalized growth curve for young anchovy larvae: Derivation and tabular example. SWFC Admin. Rep. LJ-80-17.

Rinaldo, R., R. Evans, and P. J. Vergne. 1980. Western Atlantic tagging program of the United States for the international skipjack year program - cruise report. SWFC Admin. Rep. LJ-80-18.

Bartoo, N. 1980. An updated stochastic spawner/recruit relationship for north Atlantic albacore. SWFC Admin. Rep. LJ-80-20.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

NOAA Ship Townsend Cromwell Returns From Cruise to the Northwestern Hawaiian Islands

Richard N. Uchida, Task Leader of the Insular Ecosystem Study, reported that the NOAA ship Townsend Cromwell returned to Snug Harbor, Honolulu, on December 16 after completing Part II of cruise 80-05 to waters of the Northwestern Hawaiian Islands (NWHI). According to Research Assistant Paul M. Shiota, who served as Chief Scientist on the first leg of the cruise from Honolulu to the Midway Islands, catches made by various gears indicated relatively good concentrations of commercially valuable species such as red snapper (Etelis marshi), opelu (Decapterus macarellus), and fair concentrations of caridean shrimps (Heterocarpus ensifer and H. laevigatus), in the survey area. The Cromwell also intensified efforts to locate fishing grounds for kona crab (Ranina ranina) during the cruise. According to Shiota, results from previous cruises revealed the presence of kona crabs over sandy bottoms at several locations in the NWHI. On the current series of cruises, Honolulu Laboratory scientists attempted to define the kona crab's distribution and relative abundance more precisely in order to evaluate its commercial potential. Other activities included night "jigging" of opelu and akule during the dark moon phases of the month, an activity which was particularly productive at French Frigate Shoals.

After a brief layover at Midway Islands, the Cromwell visited several seamounts in the northwest end of the Hawaiian chain. Uchida, Chief Scientist for the return leg of the cruise, reported excellent bottom fishing at Pogy Bank, one of the banks in the Nero Seamont complex located about 40 miles southwest of Midway. Here the catch rate of bottom fish, mostly red snapper (E. marshi) and sea bass (Epinephelus quernus), reached 6.1 fish per line-hour. According to Uchida, the entire Nero Seamount complex is poorly charted on existing navigational charts; therefore, in addition to conducting exploratory fishing, the Cromwell made some transects with the echo sounder to better define the topography of the bank.

Considerable effort was made on the return leg of the cruise to locate additional shrimp trapping grounds of commercial potential. Uchida said that concentrations of caridean shrimps were first discovered at Necker Island, Laysan Island, Pioneer Bank, and French Frigate Shoals in 1973 on a cruise of the R/V David Starr Jordan, another vessel operated by the National Ocean Survey. The Cromwell's shrimp trapping operations have revealed that caridean shrimps also occur in varying densities at Gardner Pinnacles, Maro Reef, and St. Rogatien Bank. According to Uchida, the catch rate, which was highest at Gardner Pinnacles, is only about a third of that obtained for trapping conducted off Oahu several years ago. Uchida estimated that about 27% of the H. ensifer and 56% of the H. laevigatus at Gardner Pinnacles were ovigerous.

Another interesting observation was that about 21% of the H. ensifer catch at Gardner Pinnacles consisted of cannibalized individuals. The highest rate of cannibalism occurred in traps with large catches and in which the bait supply was nearly exhausted.

Assisting Shiota and Uchida on the cruise were Research Assistants Darryl T. Tagami, Victor A. Honda, Steven H. Karmer, Nathaniel Shippen, and Systems Analyst George W. T. Liao. Also included in the field party were Wildlife Biologists Dr. William G. Gilmartin and Eric P. Knudtson, who were responsible for monk seal censusing and scat collection, and Dr. Nancy Withers and Deborah Burns of the University of Hawaii Sea Grant Program, who collected algae samples for their ciguatera research.

Samples Collected for Histamine Study

Research Assistant Robert B. Moffitt assisted Dr. Walter Staruszkiewicz of the U.S. Food and Drug Administration during the week of December 8 in collecting fresh mahimahi, Coryphaena hippurus, as samples for a histamine study. Dr. Staruszkiewicz is planning to use these specimens, plus others collected on cruises of the Townsend Cromwell, to examine histamine buildup in poorly preserved fish.

FISHERY MANAGEMENT PROGRAM

Estimated Skipjack Tuna Landings in Hawaii for 1980 Below Long-Term Average

The December 1980 Hawaii landings of skipjack tuna were estimated at 47.2 metric tons (MT), which is 37.6 MT below the December 1979 landings and 81.3 MT below the 1964-79 long-term average for December. The cumulative landings for 1980 (January through December) were estimated at 1,470.7 MT, which is 1,265.9 MT below the 1979 landings and 2,092.7 MT below the 1964-79 long-term annual average.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

Visiting Professor at Center Collaborates on Study of Anchovy Larvae and Carnivorous Copepods

Dr. Kurt Lillelund, Professor from the University of Hamburg and Director of the Institut fur Hydrobiologie und Fischereiwissenschaft, is on sabbatical leave at the Southwest Fisheries Center from October 1980 to the end of February 1981. Lillelund is working with Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, on the prey/predator relationship of anchovy larvae and marine carnivorous copepods. Experiments done by Lillelund and Lasker (1970) in La Jolla gave indications that the mortality of yolk-sac anchovy larvae may be determined, to a certain extent, by predation of carnivorous copepods. Further experiments were conducted this month to gain more information on the transferability of the experimental findings to natural conditions, with particular emphasis being given to new techniques on copepod maintenance. A few experiments have been done to compare natural mortality rates of anchovy larvae in containers with differing surface/volume ratios and with different numbers of copepods and larvae. Lillelund expects to begin predation experiments during January 1981.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Pilot Logs for Aerial Marine Resources Monitoring System Coded for Computer Use

Dr. Gary Stauffer, Fishery Biologist, and Susan Iacometti, Computer Programmer, report that the Aerial Marine Resources Monitoring System (AMRMS) pilot logs for 1979 have now been completely coded. Iacometti will also be compiling Anchovy Spotter Pilot Report Summaries for 1978 and 1979, as well as summaries for other species for the years 1972-1979, at the request of George Hunt of UC Irvine. Substantial changes have occurred recently in the personnel lists of participating spotter pilots. Paul and Jack Mardesich, who have been with the program since the early 1960s and have contributed hundreds of flight logs, have announced their retirement. A new fish spotter, John Winkler, has joined the program, bringing the total number of participating pilots to five.

Second Planning Meeting for 1981 Egg/Trawl Survey Cruises Held

The second planning meeting for the 1981 CalCOFI egg/trawl cruises was held on December 5 at the Center. SWFC attendees included Dr. Paul Smith, Dr. John Hunter, Dr. Gary Stauffer, Susan Picquelle, and Dr. Nancy Lo, with Alec MacCall, Herb Frey, and Ken Mais participating from the California Department of Fish and Game. This meeting was a continuation of one held on October 15 (reported in the October 1980 Center Monthly Report) and centered upon problems in the larva census and egg production biomass methods. Two main problem areas are: 1) potenial bias in the fraction of females spawning based on Day-1 post-ovulatory follicles, and 2) shipboard sampling procedures for the Department of Fish and Game charter vessel. No new solutions to the sample bias problem were offered, although Hunter suggested that he could develop new criteria for staging of post-ovulatory follicles which would aid in examining the duration of the bias. Stauffer will work with Mais, to solve the at-sea sampling problems arising from the limited laboratory and storage space on the charter vessel.

It was agreed that the collection of samples from commercial purse seiners might proide some valuable information concerning these problems. Stauffer subsequently contacted the Fisherman's Cooperative Association of San Pedro, and found the fishermen willing to discuss the possibility of working with NMFS and CF&G to get purse seine-caught anchovies to match with trawl samples collected during the upcoming February 1981 CalCOFI cruises.

Anchovy Biomass Estimation Study Continues

This month, Statistician Susan Picquelle continued her investigation of the sampling problem associated with estimating the spawning fraction in anchovies. This fraction equals the proportion of females that spawn on any given night. By examining a female's ovaries, scientists can tell if the fish spawned (or will spawn) on the night of capture (Day-0), if the fish spawned one night earlier (Day-1), or if the fish spawned more than 32 hours before capture. The proportion of females in either of the first two categories constitutes an estimate of the spawning fraction. The observed proportion of Day-0 females, however, is consistently greater than the observed proportion of Day-1 females. This suggests that the Day-0 females are over-sampled.

Dr. John Hunter had earlier determined that a relationship exists between the time of day the fish are sampled (time of trawl) and the proportion of Day-0 females in the sample. Using data from 1978-1980 for the months of February-April, Picquelle attempted to ascertain the nature of this relationship by grouping the data into one-hour intervals by time of trawl. The proportions of both Day-0 and Day-1 females were computed for each interval and plotted versus time of day. It was demonstrated that the fraction of Day-0 females peaks during 2100-2200, which corresponds to the time of night when most spawning occurs, thus suggesting that females are more vulnerable to the trawl net during spawning. If the fraction of females spawning is steady from one night to the next, then the ratio of the two

proportions should be approximately equal to 1. A plot of the Day-0 proportion against the Day-1 proportion of each time interval was executed, and the plotted points were close to the 45-degree line which indicates a 1:1 ratio, except for the points corresponding to the 2100-2300 period, when most spawning occurs.

Fishing Partyboat Data Analysis Prepared for Center

Dr. Daniel Huppert, Task Leader, and Economist Cynthia Thomson report that they have completed additional analysis of the fishing partyboat data collected for the Southwest Fisheries Center by Natural Areas, Inc., under contract, during 1978 and 1979. (A report on this contract is now available as SWFC Administrative Report No. LJ-80-14C.)

Thomson summarized the 4,238 observations by passengers by fishing trip. The resulting 367 trip averages contain information on expected and actual catch in four species groups, trip location, trip type, weather conditions, vessel capacity, length of trip (in hours), number of passengers on the vessel, average passenger characteristics (income, frequency of fishing, length of fishing experience), fraction of passengers satisfied or dissatisfied with the trip due to crowding or weather conditions, and passenger expenditure (fare, food, and lodging if applicable, rental or purchase of fishing gear, and travel distance).

A variety of relationships revealed in this data set will be useful in testing theoretical hypotheses and in perfecting more sophisticated economic models of recreational values. Some relationships examined through regression models are: response of passengers to weather and crowding conditions on vessels, physical trade-offs among species groups (multiple output production function), and relationship between fare (fee per passenger per trip) and trip length and vessel capacity.

A summary of these investigations is as follows:

Crowding and weather effects

Logit probability models were estimated to determine whether anglers' asssments of weather and congestion aboard the partyboat could be predicted from certain objectively measured trip characteristics. Separate models were estimated for four geographical regions in California covered by the fishery: San Diego, Santa Monica, Santa Barbara, and San Francisco. Analysis showed that for each geographical area, the logit models proved to be a very poor predictor of passenger responses to weather.

Results also show that two measures of congestion - the number of passengers aboard the vessel and the percentage of the vessel's capacity filled - are statistically significant in all areas. Together they explain approximately 40% of the variation in the dependent variable in the three southernmost regions but only 12% in San Francisco.

Production function

Using one form of a multiple output production function which has proved useful, Huppert and Thomson demonstrated that tradeoffs among species groups are occurring and that length of trip does have an impact upon catch.

Determinants of fare

The prior expectation was that partyboat fares would be closely associated with average unit passenger carrying costs. Thus the fare charged on a given type of vessel should rise with the length of fishing trip. Vessel size is another factor which significantly affects cost per passenger and therefore partyboat fare. Vessels with very large passenger carrying capacities (e.g. greater than 100) do not necessarily have proportionally larger fuel and capital costs. Thus the expectation was that the average fare on the larger vessels would be smaller for a given trip length. A multiple regression equation supported both of these hypotheses.

MULTISPECIES TAXONOMY PROGRAM

La Jolla-Scientists Attend Widow Rockfish Workshop

Fishery Biologists Dr. Geoff Moser and John Butler, Multispecies Taxonomy Program, and John MacGregor, Commercial and Recreational Fisheries Research for Management Program, attended a workshop on the widow rockfish held at the Tiburon Laboratory, December 11-12. Moser presented a paper, co-authored with Butler, on rockfish rearing. As a follow-up to the workshop, Moser spent 3 days in the ichthyoplankton laboratory of the Northwest and Alaska Fisheries Center, working on their samples of rockfish larvae and juveniles.

Identification of Eggs/Larvae from Vertical Distribution Cruise Nearly Completed

Dr. Moser reports that identification of the eggs and larvae from vertical distribution cruise 8003EB continued through December and is nearing completion. The MESSHAI (plankton) samples were completed this month, as were the manta (surface) net samples. The processing of the opening/closing Bongo net samples should be completed in January 1981.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

First Production Phase of New CalCOFI Atlas Completed

Dr. Paul Smith, Task Leader, reports that the first phase of production for a CalCOFI atlas depicting mean seasonal distribution of oceanographic parameters in the California Current, was completed early this month. Two

hundred and eighty computer plots, comprising vertical sections along eight cardinal lines in the CalCOFI pattern and two lines approximately parallel to the coast, were delivered to CalCOFI Illustrator Fred Crow for finishing touches. Smith also reports that computer runs have been completed for the second phase of production, which will yield 48 additional plots. These will depict standard deviations, by season, for four oeanographic parameters (temperature, salinity, oxygen and sigma-t) along CalCOFI lines 60, 90 and 120. Preparations are nearly completed for initiating computer runs in the third and final phase. This will involve mapping selected oceanographic parameters on three constant density surfaces and two constant depth surfaces.

Data Report Completed on 1979/1980 Staged Anchovy Eggs and Larvae

Cindy Haight, a San Diego State University graduate student temporarily assigned to the Coastal Division, has completed a data report on the 1979 and 1980 staged anchovy eggs and larvae. The draft Administrative Report has information on anchovy eggs for 1979 regrouped by days of spawning to be consistent with the 1980 anchovy egg daily groupings. In addition to a printout of the data, the report includes a program to retrieve the data by station, and a program for dividing the data into regions and times of day to form the averages used for anchovy management. A portion of the data has already been sent to a citizen interested in this portion of the egg production method, which is under development for setting anchovy quotas to maintain the optimum sustainable yield.

Manuscript on Analysis of Historical Larval Anchovy Catch Rates Being Readied

Roger Hewitt, NOAA Corps, has completed the first draft of a manuscript describing an analysis of historical larval anchovy catch rates. Three time series were generated: annual estimates of larval dispersal, larval mortality and an index of larval production for most of the years from 1951 through 1979.

Dispersal rate showed little dependence on wind-induced mixing and was clearly correlated with the initial intensity of the spawning pattern. The intensity of the dispersion pattern of yolk sac larvae remained relatively constant over a 10-fold range in larval density. Thus, the patchy character of larval distribution was conserved as the density of larvae increased. This observation is consistent with a variety of circumstances, ranging from a constant population abundance and a changing spawning interval, to a changing population abundance and compensatory adjustment at several behavioral scales.

Mortality was not correlated with dispersal but related positively to spawning intensity. An index of larval production was derived by adjusting the larval census estimate for the effect of mortality. The time series indicates a more dramatic increase in larval production than that inferred from the larval census estimates. Mortality was positively related to larval production. If larval production indexes stock size and if recruitment is governed by larval mortality, then the relationship may be regarded as the functional form of the stock-recruit curve.

Equations of Long-Term Seasonal Cycle of Anchovy Spawning Ready for Use

Dr. Paul Smith has completed a formulation of a uniform series of equations of the long-term seasonal cycle of anchovy spawning. Review of other literature, particularly a manuscript by Dr. John Hunter and Roger Leong, and data collected on growth rates by Rick Methot, former graduate student at the Scripps Institution of Oceanography, indicate that the same equation can be used for other studies. The seasonal cycle of batches of eggs spawned per month, somatic water content, and dry egg weight, coincide with the spawning seasonal cycle, while the anchovy fat cycle and larval growth weights are inversely related.

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Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division at the La Jolla Laboratory, has been invited to join the Board of Advisors for the Marine Ecology Progress Series. The invitation was issued by Dr. Otto Kinne, Editor of the Series, who is stationed at the Biologishe Anstalt Helgoland Laboratory in the Federal Republic of Germany.

Oceanic Fisheries Resources Division

MARINE MAMMAL ASSESSMENT AND MONITORING PROGRAM

Au Presents Joint Paper at Meeting of the American Society of Limnology and Oceanography

Dr. David Au, Operations Research Analyst at La Jolla, was one of the authors of a joint paper with Dr. Philip Dustan, Dr. Raymond Smith, and Karen Baker, all of the Visibility Laboratory, University of California, San Diego, which was presented (by Dr. Dustan) at the winter meeting of the American Society of Limnology and Oceanography, December 27-30, in Seattle, Washington. In this paper, the researchers discussed the association of cetaceans, oceanic chlorophyll, and mesoscale features off the California coast. They noted that remote sensing of chlorophyll may enable interpretation of cetacean distribution patterns in terms of biological and physical processes occurring over the coastal shelf and slope.

Joint IATTC/SWFC Aerial Photographic Study of Porpoise Populations Completed

On December 15, final field work was completed in Tapachula, Mexico, on the Joint Inter-American Tropical Tuna Commission (IATTC)/Southwest Fisheries Center (SWFC) aerial photographic study of porpoise populations. Participants LCDR Wayne Perryman, NOAA Corps, and Frank Ralston, Computer Specialist at the

La Jolla Laboratory, returned to San Diego with an extensive collection of very high resolution photographs which are currently being catalogued and prepared for detailed examination. Perryman will be heading up the data extraction process for the study.

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Study of Age and Sex Structures of Porpoise Schools Underway

Dr. Warren Stuntz, Fishery Biologist, and Charles Oliver, Computer Specialist, La Jolla Laboratory, report that analysis of data on large portions of porpoise schools captured by the purse seiner, Queen Mary, during the dedicated vessel cruise, have been completed and tabulated. Data was obtained using the porpoise impoundment system and were collected to analyze whole school age and sex structure. The sex ratio of all age classes of spotted porpoise was shown to be nearly 1:1. The age structure of the same schools, based on color pattern data, showed the adults to make up 60% of the population. The "mottled" color pattern phase accounted for 12%, the "speckled" phase made up 19%, the "two-tone" phase made up 8%, and the neonates accounted for less than 1% of the spotted porpoise examined.

Porpoise observer kill data for the same year shows a similar pattern, but only in large kill sets (greater than 40 animals). Large kill sets showed 59% adult, 15% mottled, 15% speckled, 10% two-tone, and again less than 1% neonate, indicating that the kill in large-kill sets may be cross-sectional or close to the composition of porpoise captured. The fishery data have not yet been stratified by the "life history" data (from animals dissected by the observers) in a similar way.

Manuscript on Energetics of Spinner Porpoise in Preparation

Dr. Stuntz is preparing a manuscript on the energetics of Hawaiian spinner porpise which describes a method for obtaining a daily energy budget for porpoise using radio tracking data. Stuntz found that during the day, the spinner porpoise had a low respiratory rate but that at night, when this species is most active, the respiratory rate nearly doubles.

Biologists Inspect Dead Pilot Whales and Sea Lions at Santa Catalina Island

On December 18, Fishery Biologist John Henderson, Southwest Fisheries Center, and Wildlife Biologist Dana Seagars, Southwest Region, traveled to Santa Catalina Island, California, to inspect carcasses of short-finned pilot whales, Globicephala macrorhynchus, which had been observed from the air approximately one week earlier, floating 1-3 kilometers off the southwest end of the island. Riding aboard a Coast Guard launch and aided by a Department of Fish and Game spotter plane, the biologists located three of the reported

six carcasses, as well as two dead California sea lions, Zalophus californianus. Two of the whales were missing flukes and the two sea lions exhibited gunshot wounds.

One sea lion and the remaining whale were collected and towed to the Catalina Marine Science Center where the biologists examined them and collected specimens. Stomach contents (squid in both cases), reproductive organs, and the skeletons were retained from these animals. One of the gunshot wounds in the sea lion was severe enough (vertebrae destroyed) to have been fatal; the cause of death of the pilot whale was not apparent.

Tetracycline-marked Specimen Used to Calibrate Age in Manatees

Dr. Al Myrick, Wildlife Biologist, recently received materials obtained from a Florida manatee given two therapeutic treatments of tetracycline during its one year of life in captivity. Thin sections of the periotic, ribs, mandibles, and cheek teeth show distinct fluorescent labels in the last-formed layer. Sublayers previously interpreted as monthly layers in the ontogenetic series of manatee materials examined for the USFWS recently, indicate that the clinical treatments were administered to this new specimen 12 months and 6 months before death. Comparisons of the labels to the stainable layer patterns suggest that one growth layer group, distinguished by intensely stained borders in prepared thin sections, is formed each year.

A report describing the development and calibration of the aging technique for manatees is in preparation by Myrick and Jeff Kelly, student intern from Southampton College.

Staff of Marine Mammal Age Determination Laboratory Augmented to Process and Read Age Samples of Dolphin Teeth

Responding to reprioritized program needs for updated evaluations of age composition data for ETP dolphin stocks, Dr. Al Myrick is implementing plans to speed up the preparation and reading of dolphin tooth thin sections. The laboratory recently acquired additional equipment and personnel for production-line preparation of large samples of randomly selected teeth using a batch-processing method developed by Biological Technician Priscilla Sloan. Age determinations will be made by two readers examining the same samples independently, but using a standardized, time-calibrated system developed by Myrick. It is expected that the production-line approach will reduce (by up to one-half) the time previously required to make age data available.

Page Proofs Received for Aging Conference Volume

Dr. Al Myrick reports that, after several delays, the papers and workshop report on "Age determination of toothed cetaceans and sirenians" are now being received in page proof. The volume will be publiished as International Whaling Commission Special Issue No. 3 (hardcover) and should become available early in 1981.

Scientist Chosen to Head Coastal Marine Mammal Program

As reported in the November 1980 Center Monthly Report, Dr. Douglas DeMaster, Wildlife Biologist, has been chosen to lead the Coastal Marine Mammal Program, responsible for conducting research on the life histories and fisheries-interaction problems of marine mammals that occur off the California coast. The program will be directed primarily at assessing fisheries conflicts and population status of the following species: California sea lions (Zalophus californianus), northern elephant seal (Mirounga angustirostris), harbor seal (Phoca vitulina), Guadalupe fur seal (Arctocephalus townsendi), common dolphin (Delphinus delphis), bottlenose dolphin (Tursiops truncatus), and short-finned pilot whale (Globicephala macrorhynchus).

SWFC Biologists Coordinate Fisheries/ Marine Mammal Conflict Studies

Dr. Doug DeMaster and LCDR Terry Jackson worked with John Scholls, California Department of Fish and Game, in planning an aerial survey of Santa Catalina Island to assess movements of marine mammals associated with the squid fishery. Recording forms were designed and way points for transect legs were plotted. The survey was planned for December 15-19, 1980, and was conducted by CF&G personnel. Jackson participated in the first day of the survey, which was designed to assess the variability in hauling pattern of California sea lions during the squid fishing season, as well as to assess movement patterns and densities of various cetacean species, particularly pilot whales. The survey is being conducted under a fisheries/marine mammal conflict study contract to CF&G from the Regional Office (NMFS-Terminal Island) and the SWFC, jointly.

Manuscript Concerning Population Modelling of Marine Mammal Completed

Dr. DeMaster has completed a final draft of the paper, "A simple and realistic population model for marine mammals," which is intended for publication in the Journal of Fisheries and Aquatic Sciences. Described in the text is a generalization of a previously developed life-history model that assumed longevity was infinite. The new model allows the incorporaton of information concerning the maximum age for a species. For species where the maximum age is less than 30 years, approximating the schedule with a truncated geometric series was found to be preferred. The other variables in the model include: the age of first birth, survival of calves, yearlings and older animals, adult reproductive rate, and the discrete population growth rate.

Technician Returns from 3-month Tuna Cruise

Tod Foster, Biological Technician, returned to San Diego on December 28 after having completed the ETP segment of the Maria C. J. charter which began September 22. During the cruise, he collected bathykymograph recordings of net depth performance, net-surface-area estimations, underwater observations

of backdown, setting speed observations, and recordings of engine RPM's during backdown. These data will supplement those collected on the local segment of the charter and will be summarized in the cruise report for the complete charter.

Southampton College Intern Completes SWFC Assignment

Steve Storch, a student from Southampton College, Long Island, New York, is returning to school after completing a Student Internship at SWFC. Storch has been working with Dr. Warren Stun z and Jim Coe, Supervisory Fishery Biologist, on an analysis of causes of kill of the common dolphin, Delphinus delphis. He completed a computer analysis of the data on common dolphin kill for the years 1974 through 1980 and is presently preparing a report on his findings.

Sundown Sets by Tuna Purse Seiners Analyzed

Jim Coe, Supervisory Fishery Biologist, and staff are working on an expanded analysis of "sundown" sets (sets in which the dolphin-rescue maneuver called "backing down" is completed by the tuna seiner after dark) on tuna associated with porpoise. Kill by-vessel data are being examined to understand processes involved in sundown sets that may contribute to high kill rates.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Widow Rockfish Workshop Held at Tiburon Laboratory

Dr. William H. Lenarz, Leader of the Rockfish Analysis Task, chaired a Widow Rockfish Workshop at the Tiburon Laboratory, December 11-12, 1980, to discuss research on the species and fishery. Thirty-one members of the research community and fishing industry attended, and 16 papers were presented during two technical sessions chaired by Investigation Leader Dr. Edmund S. Hobson of the Tiburon Laboratory, and Tom Jow of the California Department of Fish and Game, Menlo Park. The workshop was concluded by a discussion panel chaired by Lenarz and Edward Ueber, Industrial Economist of the Tiburon Laboratory. The panel, composed of members of the industry and Groundfish Management Plan Development Team, discussed problems associated with stock assessment and marketing of widow rockfish. Lenarz and Thomas Dark of the Northwest and Alaska Fisheries Center are preparing a summary of the meeting. Plans to publish most of the technical papers as a collection in a NOAA Technical Report are being considered.

Tag Returns Shed Light on Movements of Brown Rockfish

Dr. Lenarz reports that two tagged brown rockfish have been recovered at least 12 miles from their original release sites: one was caught in the Half Moon Bay area on the California coast south of San Francisco, and one returned to the Laboratory dock after being released at Stinson Beach, on the California coast north of San Francisco. The latter had been tagged and released 3 months prior to recovery (see September 1980 Center Monthly Report). The fish caught at Half Moon Bay was released at Tiburon in December 1977. Brown rockfish have been observed to remain closely associated with the Laboratory dock for about the first 3 years of life, then begin to disappear from the area. They are able to return to the dock from sites up to 5 miles away if transplanted during this early phase. Tagging and tag recovery allows laboratory scientists to follow the movement of brown rockfish within and around San Francisco Bay, as part of an on-going study of rockfish population dynamics.

FISHERIES DEVELOPMENT INVESTIGATION

Octopus and Shortbelly Rockfish Fishery Development Projects Underway

Three fishery development projects are currently in various stages of planning and implementation. Because octopus fishing remains a potential fishery of interest to northern and southern California fishermen, a contract

will be awarded to a firm (presently undesignated) for construction of octopus traps. These will be used in joint projects with the fishermen. Laboratory personnel will also fish for shortbelly rockfish on a cooperating fisherman's vessel in the near future. The fish will be packed for trial sale in Japan. Bids are now being taken for two charter cruises in January and February which will explore deep-water trawling grounds off central California, and test new fishing gear for shortbelly rockfish. Construction of the new trawl has also been put out on bid.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Striped Bass Larvae Manuscript Galley Being Reviewed

The galley for the manuscript entitled "Effects of food and feeding factors on laboratory-reared striped bass larvae" by M. B. Eldridge, J. A. Whipple, D. Eng, M. J. Bowers, and B. M. Jarvis, has been received for review. It will be submitted for publication to the Transactions of the American Fisheries Society.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

SWFC Technical Support Services Management Transferred to Data Systems

A word processing study was recently completed by the Mattox Group for the Southwest Fisheries Center La Jolla facility, recommending the integration of the office and information support functions. Based upon this recommendation, Dr. Izadore Barrett, Center Director, transferred mangement of the Editorial Typing Services (ETS) to Fred Kellenberger, SWFC Data Systems Manager. Responsibility for reprographics, mail distribution, public reception and communications were also transferred to Kellenberger. The new group encompassing these responsibilities is called the Technical Support Group (TSG). A technical study committee was formed to establish workload standards and procedures, a typing system, and a standard filing system, with representatives from the Oceanic Fisheries Resources Division, Coastal Fisheries Resources Division, Director's Office, Executive Officer's Office, and the Data Systems Manager. The physical layout of the Administrative Office (building A, 2nd floor) will be modified in January 1981, to accommodate changes in responsibility and procedures for administrative and technical support services, and to enhance the working environment of the staff.

ADP Documentation Standards Committee Meets in La Jolla

On December 10-12, the ADP Documentation Standards Committee met at the La Jolla Laboratory. Dale Sortland from NMFS Headquarters, Washington, D.C., Kay Paine from the Northeast Fisheries Center, Dick Baie from the Northwest Fisheries Center, and Dorothy Roll and Robert Butler from the Southwest Fisheries Center, reviewed the first draft of the documentation standards. Using suggestions submitted by users of the draft documents, the committee restructured the document for ease of use. The standards will be forwarded to the National Data Management Committee for their review and the approved standards will be recommended as national guidelines for adoption by the field offices.

Computer Tapes Generated for Two Economics Studies

Robert Butler, Computer Programmer, has generated a tape of non-sensitive information from the Vessel Registration File on the Pacific Area Cooperative Enforcement System (PACES) for Dennis King, Professor of Economics at San Diego State University, San Diego, California. Under a Sea Grant fund, King will use these data to develop sampling strategies, based upon vessel characteristics, home port, and names and addresses of vessel owners. Butler has also produced a source tape of catch statistics data from the Coastwide Data System, which will be used for an economics study by Dr. Daniel Huppert, Task Leader of the Commercial and Recreational Fisheries Research for Management Program, SWFC.

Teletype to Radio Station WWD Transferred to SWFC's ADP Operations

Fred Kellenberger, Data Systems Manager, reports that the responsibility for the teletype with direct line to the radio station WWD on the University of California at San Diego's campus was transferred from the Real Time Environmental Project to ADP Operations. Station WWD is a Commerce-licensed station operated by UCSD's Scripps Institution of Oceanography. The teletype responsibilities include the monitoring of daily messages from WWD and the transmission of messages to WWD. Messages to the radio station are then relayed by the station to the final destination. Kathy Senini, Computer Technician, has been delegated the key operator of the teletype. The alternate operators designated in her absence are Bob Nydam and Ginny Hostler from the Oceanic Fisheries Resources Division, and Jim Thrailkill and Rich Charter from the Coastal Fisheries Resources Division. These operators attended a training session to learn how to operate the teletype and how to send messages to the radio station. The sending of messages will follow a standard format.

Sportfish Catch Data and FAX System Reviewed

Computer Programmer Oden Burris is reviewing the job request for Sportfish Catch data from Richard Parrish of the Pacific Environmental Group (PEG), Monterey, California, and will write a new analysis program for processing the data on the Burroughs/VAX system. The problem with the calculation of catch-per-unit-effort (CPUE) for this data has not been resolved.

Burris is also working with Robert Butler to finalize the system and user's document of FAX. FAX is a computer system developed for the Oceanic Fisheries Resources Division to monitor and report the use of the facsimile machines aboard fishing vessels. This system is being transferred to the National Weather Service for maintenance.

MISCELLANEOUS

PUBLIC AFFAIRS

La Jolla Laboratory

SWFC and SWR Participate in First Annual "Day at the Docks" in San Diego

The San Diego Sportfishing Council and the Port of San Diego sponsored an open house on Sunday, December 14, at the sportfishing landings along San Diego Harbor. The Southwest Fisheries Center and the Southwest Region were invited to participate and to represent the National Marine Fisheries Service's role in recreational fisheries. About 10,000 people attended this first annual "Day at the Docks." Roy Allen and Ron Dotson set up and manned the La Jolla Laboratory exhibit display, which was well-received by the public. The exhibit featured information on striped marlin fishing, tuna fishing, and the 200-mile limit. Seafood Consumer Specialist Doris Robinson, and Assistant Seafood Consumer Specialist Glenda Graves of the Southwest Regional Office, prepared seafood and distributed fish recipes to an eager line of hungry people throughout the day. Other events included fishing seminars, displays by tackle/reel manufacturers and taxidermists, free boat rides, and an open house on the sportfishing boats.

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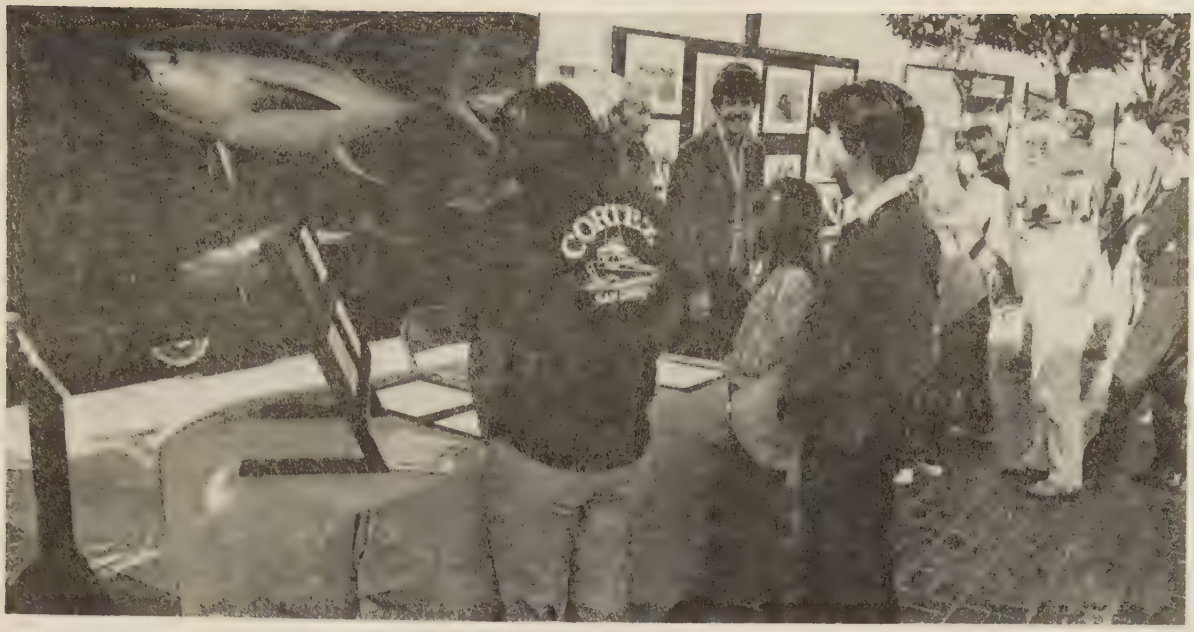
On December 4, Dr. Paul Smith spoke to Ms. Joanne Nimitz' seventh grade class at Hale Junior High School on the subject, "How many fish in a school." The lecture was part of a continuing program called "Meet the Scientist" sponsored by the San Diego County Department of Education. Center scientists have participated in the program for the past 5 years.



Ron Dotson (second from left) and Roy Allen (third from left) of the La Jolla Laboratory greet visitors and answer questions about the La Jolla Laboratory's exhibit at the "Day at the Docks" in San Diego.

Shown at left, Doris Robinson, Seafood Consumer Specialist at the NMFS Southwest Region, Marketing and Consumer Services Branch, and her assistant, Glenda Graves, distribute samples of a variety of seafood dishes to a continuous line of visitors at the "Day at the Docks" exhibit area.

SEMINARS

La Jolla Laboratory

December 5 - Dr. Al Atkinson, System Science, UCLA, presented a talk on the "Analysis of the sardine fishery collapse problem."

9 - Madelaine Silva, Federal Women's Program Manager, Naval Ocean Systems Center, spoke on "Preparation of SF-171 (Personal Qualifications Statement)."

11 - Dr. Frank Ferrari, Director, Smithsonian Oceanographic Sorting Center, Smithsonian Institute, spoke on Integumental organs in copepods, Family Oithonidae."

PRESS RELEASES

Honolulu Laboratory

December 19 - "Research vessel completes fishery survey."

TRAINING

Tiburon Laboratory

September 5- - Susan E. Smith, Fishery Biologist - Plankton Ecology

8-10 - Nancy K. Wiley, Computer Specialist - Successful Application of Mini-Computer Systems

12 - Maureen H. Woods, Librarian - Dialog Chemical Information Seminar Lockheed Information Systems, Palo Alto, CA.

VISITORS

Honolulu Laboratory

December 2 - Mike McCoy, Micronesian Maritime Authority, visited Director Richard Shomura and Dr. Jerry Wetherall.

5 - Michael Rowe, Brookhaven National Laboratory, New York, who was once a research assistant at the Honolulu Laboratory, visited R. Shomura.

8 - Dr. Nancy Withers of the University of Hawaii met with R. Shomura to discuss ciguatera.

10 - Tom Billy of F/UD2, and John Dassow, NMFS, Seattle, visited the Honolulu Laboratory. They were in Honolulu to attend the Tuna Research Workshop sponsored by the University of Hawaii.

29 - Dr. Theodore Rice, Director, Beaufort Laboratory, visited the Laboratory.

30 - Dr. Ian R. Smith, International Center for Living Aquatic Resources Management, Manila, Philippines, visited Librarian Hazel S. Nishimura.

La Jolla Laboratory

December 2 - Dr. Richard Dugdale and Dr. Bert Jones, USC, visited to discuss a new field program to study the biological effects of the Pt. Conception upwelling with Dr. Reuben Lasker.

- Andrew M. Vrooman, NMFS, Retired, San Diego, CA.

3 - Robert L. Ahlstedt, NOAA, Seattle, WA.

4 - Dr. Eric Ursin, Copenhagen, Denmark.

5 - Dr. Al Atkinson, System Science, UCLA, Los Angeles, CA.

8 - Bob Wolf and Dave Ryer, NMFS Office of Science and Environment, Washington, D.C., met with John Carr.

9 - Madelaine Silva, Naval Ocean Systems Center, San Diego, CA.

- Dale Sortland, F/SR4, Dick Baie, Northwest and Alaska Fisheries Center, and Kaye Paine, Northeast Fisheries Center, attended the NMFS ADP Documentation Standards meeting at the Center.

10 - Rick Van Schoik, NOSC, San Diego, CA.

- Craig Martin, Ocean Pacific Fisheries, San Diego, CA.

- Jim McGuire, NASO representative for the Department of Energy, met with Ben Remington.

11 - Dr. Frank Ferrari, Director, Smithsonian Sorting Center, Smithsonian Institute, Washington, D.C.

15 - Joseph J. Luczkovich, NOAA/NMFS, Sandy Hook Laboratory, Highlands, NJ.

- Dr. Jens Balchen, University of Trondheim, Norway.

Tiburon Laboratory

December 3 - Tim Durham, General Services Administration, San Francisco, CA.

4 - Dr. Izadore Barrett, Director, Southwest Fisheries Center, La Jolla, CA.

- David Mackett, Southwest Fisheries Center, La Jolla, CA.

- Murray L. Hayes, Northwest and Alaska Fisheries Center, Seattle, WA.

5 - J. E. Jackson, Southwest Region, Terminal Island, CA.

8 - Lyman Fancher, Richardson Bay Wildlife Sanctuary, Mill Valley, CA.

9 - Joseph W. Angelovic, Research and Development, NOAA, Rockville, MD.

- J. Frank Hebard, Research and Development, NOAA, Boulder, CO.

- Satoshi F. Noguchi, Tokyo, Japan.

- Charles Swezey, Research and Development, NOAA, Rockville, MD.

10 - John Butler, Southwest Fisheries Center, La Jolla, CA.

- Wayne A. Laroche, Gulf Coast Research Laboratory, Ocean Springs, MS.

- Deborah Lawlor, Woman's Way Resource Center, San Rafael, CA.

11 - William Barss, Oregon Department of Fish and Wildlife, Newport, OR.

- Dave Bernard, Oregon State University, Corvallis, OR.

- Paula Cullenberg, College of Fisheries, University of Washington, Seattle, WA.

- Thomas Dark, Northwest and Alaska Fisheries Center, Seattle, WA.

- Robert Demory, Oregon Department of Fish and Wildlife, Newport, OR.

- Douglas Edgers, College of Fisheries, University of Washington, Seattle, WA.

- Donald Gunderson, College of Fisheries, University of Washington, Seattle, WA.

- Steve Johnson, Oregon Department of Fish and Wildlife, Newport, OR.

- Ralph Larson, San Francisco State University, San Francisco, CA.

- Peter Leipzig, Fishermen's Marketing Association, Eureka, CA.

- John MacGregor, Southwest Fisheries Center, La Jolla, CA.

- Pierre Marchand, Ilwaco Fish Company, Ilwaco, WA.

- Al Millikan, Washington Department of Fisheries, University of Washington, Seattle, WA.

- Steven Schultz, California Department of Fish and Game, Mendocino, CA.

- Jack V. Tagart, Washington Department of Fisheries, University of Washington, Seattle, WA.

- Gary Thomas, College of Fisheries, University of Washington, Seattle, WA.

- Mark Wilkins, Northwest and Alaska Fisheries Center, Seattle, WA.

12 - George Boehlert, Oregon State University, Newport, OR.

- Tom Jow, California Department of Fish and Game, Menlo Park, CA.

- J. Pennisi, Royal Sea Foods, Monterey, CA.

- Lawrence F. Quirollo, California Department of Fish and Game, Eureka, CA.

- C. R. Waters, Platte River Conservation District, Manistee, MI.

16 - Dennis King, San Diego State University, San Diego, CA.

18 - Nancy A. Becker, KTIM, San Francisco, CA.

23 - Leon Barzin, Office of Habitat Protection, Washington, D.C.

29 - Elaine Ron, National Cancer Institution, Bethesda, MD.

30 - Ann Chamberlain, San Francisco State University, San Francisco, CA.

- Izumi and Reiko Nakamura, Fisheries Research Station, Kyoto University, Maizuyu, Kyoto, Japan.

31 - Margo Motter, University of Southern California, Los Angeles, CA.

Pacific Environmental Group

December 5 - Prof. Lou Botsford, University of California, Davis, CA.

- Dr. Richard Methot, Bodega Bay Marine Laboratory, Bodega Bay, CA.

Paul Wild, California Department of Fish and Game, Monterey, CA.

15 - Cho-Ting Liu, University of Washington, Seattle, WA.

22 - Dr. Valerie Loeb, San Diego Natural History Museum, San Diego, CA.

MEETINGS AND TRAVEL

Honolulu Laboratory

December 3 - Richard Shomura met with Louis Agard, former member of the Western Pacific Regional Fishery Management Council (WPRFMC), and Kitty Simonds, Assistant to the Executive Director, WPRFMC.

4 - R. Shomura attended a "Billfish Administraive Enforcement Cost Meeting" called by Kitty Simonds, at the Honolulu Laboratory.

8 - R. Shomura attended a public hearing on the spiny lobster FMP at the AMFAC Marine Center, Honolulu.

9 - At the request of Doyle E. Gates, Western Pacific Program Office (WPPO), SWR, Honolulu Laboratory and WPPO staff members met to discuss the Laboratory's proposed cooperative squid research project with the University of Hokkaido. WPPO identified some potential problems in the use of drift gill nets, such as the entanglement of marine mammals and sea turtles and by-catch of incidental species.

10 - R. Shomura, Dr. Jeffrey Polovina, James Uchiyama, and Bernard Ito met with Kenji Ego and several staff members of the Hawaii Division of Fish and Game to discuss the sampling program at Midway Islands.

11 - R. Shomura, Dr. Polovina, and J. Uchiyama met with personnel from the U.S. Fish and Wildlife Service and the Hawaii Division of Fish and Game at the Federal Building to discuss the French Frigate Shoals baitfish study.

13-18 - R. Shomura, Drs. J. Wetherall, R. Mendelssohn, and R. Skillman, and H. Yoshida and F. Riggs participated in the SWFC Tuna Research Planning Workshop at San Clemente, CA.

La Jolla Laboratory

December 1 - Dave Mackett traveled to Terminal Island, CA to attend a State/Federal Planning Meeting.

2- 4 - Dr. Michael Laurs and Dr. Norm Bartoo traveled to Reno, NV to make a presentation at the WFOA annual meeting and AFRF Board of Directors meeting.

3- 4 - Dr. Izadore Barrett, Center Director, and David Mackett attended a Groundfish meeting in Tiburon, CA.

7-12 - Dr. Izadore Barrett and Dave Mackett traveled to Washington, D.C., to attend the OD/RD/CD meeting.

8-12 - Ron Lynn attended a National American Geophysical Union meeting in San Francisco, CA.

9-20 - Dr. Doug DeMaster traveled to Honolulu, HI and French Frigate Shoal to attend a Monk Seal recovery team meeting.

11-14 - Dr. Geoff Moser, John MacGregor and John Butler attended a workshop on widow rockfish in Tiburon, CA.

15-17 - Dr. Izadore Barrett, Center Director, Deputy Director John Carr, Dave Mackett, Dr. Gary Sakagawa, Dr. Michael Laurs, Dr. Norm Bartoo, Richard Evans, Ron Rinaldo, Wes Parks, Al Coan, Sam Herrick, Jim Squire, Earl Weber, and Tony Majors traveled to San Clemente, CA to participate in the SWFC Tuna Research Workshop.

16-19 - Dr.Tim Smith traveled to Seattle, WA to assist with a review of fur seal research program at NWAFC.

17-18 - Fred Kellenberger traveled to Long Beach, CA to attend FIN and ADP meetings.

26-31 - Geoff Moser traveled to Seattle, WA to study rockfish larvae at the Northwest and Alaska Fisheries Center.

Tiburon Laboratory

December 1 - Edward Ueber traveled to Santa Cruz, CA, and met with Dr. Michael Orbach, Associate Director, University of California, to discuss a quarterly report on a sablefish project.

1- 3 - Norman J. Abramson traveled to Portland, OR, to attend a Pacific Fishery Management Council's Meeting of the Pink Shrimp management Plan Team.

4 - Dr. Izadore Barrett and Dave Mackett, Southwest Fisheries Center, and Dr. Murray Hayes, Northwest and Alaska Fisheries Center, met with Norman J. Abramson at the Tiburon Laboratory to discuss coordination of the two Center's Groundfish Programs.

9 - Dr. Jeannette A. Whipple held a meeting with represen-

tatives of the Office of Marine Pollution Assessment (OMPA) at the Tiburon Laboratory. Attendees included: Dr. Joseph W. Angelovic, Research and Development, NOAA; Dr. J. Frank Hebard, Research and Development, NOAA; Mr. Charles Swezey, Research and Development, NOAA; and Mr. Roy Overstreet, Office of ERL, Boulder, CO. The main objective of this meeting was a management review of the Marine Sanctuaries Act 202 funding at Tiburon.

11-12 - Dr. William H. Lenarz chaired a Widow Rockfish Workshop at the Tiburon Laboratory. The main purpose of this workshop was to discuss research on the species and fishery.

Pacific Environmental Group

December 8-10 - Mr. David Husby traveled to San Francisco, CA to attend the AGU meeting.

9-10 - Dr. Douglas McLain, traveled to San Francisco, CA to attend the AGU meeting.

15-17 - Dr. Richard Parrish traveled to San Clemente, CA to attend the SWFC Tuna Research Workshop

PERSONNEL ACTIONS

Honolulu Laboratory

November 30 - Gary L. Steiger, Biological Aid (Fisheries) Part-Time Temporary Appointment

December 18 - James H. Prescott, Biological Technician (Fisheries) - Completion of Temporary Appointment

28 - Bert S. Kikkawa, Biological Technician (Fisheries) - Promotion

30 - Darryl T. Tagami, Biological Technician (Fisheries) - Conversion to Full-Time Permanent Status

31 - Dennis L. Kees, Biological Aid (Fisheries) - Completion of Temporary Appointment

La Jolla Laboratory

November 30 - Merle Marrow, Maintenance Worker - Conversion to Full-Time Permanent Appointment

December 12 - Lonnie Dick, Computer Technician - Resignation

28 - Dimitry Abramenkoff, Biological Technician - Conversion to Full-Time Permanent Appointment

- Priscilla Sloan, Biological Technician - Conversion to Full-Time Permanent Appointment

- Barbara MacCall, Fishery Biologist - Conversion to Full-Time Permanent Appointment

- Kenneth Wallace, Computer Specialist - Conversion to Full-Time Permanent Appointment

Tiburon Laboratory

November 30 - Susan Pollock, Biological Aid - Extension of Appointment (130 days)

December 3 - Karen Taberski, Biological Technician - Expiration of Appointment

15 - Karen Taberski, Biological Technician - One-Year Student Appointment

16 - Lisa M. Andrade, Biological Aid - Expiration of Appointment

NEW ADDITIONS TO CENTER STAFF

VIRGINIA (GINNY) HOSTLER

Ginny began work at SWFC in September, thus continuing a career with the Federal government which has spanned 13 years. Before coming onboard at SWFC as Secretary for the Oceanic Fisheries Division, she worked for the Department of Applied Mechanics and Engineering at UCSD. Her career with the government has included serving in the Office of Hydrology at Weather Service Headquarters in Silver Springs, Maryland, from 1973 to 1979.

SUSAN IACOMETTI

Susan joined SWFC in August as a Computer Specialist for the Commercial and Recreational Fisheries Research for Management Program. A native San Diegan, she is a graduate student at San Diego State University and will receive her M.A. in Geography, with a Computer emphasis, in June. Before she came to the SWFC, she taught computer mini-courses at SDSU, worked at SDSU's computer center, and did computer consulting work. She has also done computer-mapping for the then-Integrative Planning Office of San Diego County.

LORRAINE (LORI) ZORICH

Lori joined Administrative Services at SWFC as an Administrative Assistant in August. She has been with the Federal government for 7 years, having served the Northwest and Alaska Fisheries Center (NWAFC) as an Administrative Assistant before coming to San Diego. Before her duty with NWAFC, she worked at the Hammond, Oregon, Biological Field Station. Lori assists with staffing and personnel matters at SWFC, and acts as an informaton liaison on many personnel/staff questions.

UNITED STATES
DEPARTMENT OF COMMERCE

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